Skin Cancer Detection using Digital Image Processing

ROBIN SINGH[1], PRASANNA LAKSHMI R[2], HARISH NARASIMHAN A[3], Prof. SWARNALATHA P[4]

[1,2,3,4]*Department of Computer Science Engineering, Vellore Institute of Technology, Vellore, TamilNadu, India*

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Abstract - *Currently it is really very important to watch and analyze the cancer disease automatically at intervals the first stages. Irregular streaks square measure one in every of the foremost very important features(included in most of the dermoscopy algorithms) that show high association with carcinoma and basal cell malignant growth malady. So we have a tendency to tend to square measure going for the machine-driven detection. Here we have a tendency to tend to square measure practice the GLCM choices for the detection. the choices of skin lesions square measure extracted normalized symmetrical grey Level Co-occurrence Matrices GLCM.GLCM based texture choices square measure extracted from each of the four classes and given as input to the Multi-Class Support vector machine that'sutilized for c1assification purpose. The highest accuracy achieved is 77% till now.*

Keywords: Melanoma; Digital Image; Carcinoma

1. INTRODUCTION

In skin health, diagnosing is that the method of distinguishing a skin texture or drawback by its signs, symptoms and therefore the results of numerous diagnostic procedures. The result reached through this method is termed a diagnosing. The identification system is a system that may be accustomed to analyze any drawback by responding to some queries that result in an answer to the problem. Carcinoma is a metastatic tumor that grows within the skin cells and accounts for over 50 % of all cancers. Within the United States of America alone, over one million Americans are going to be diagnosed in 2007 with non-melanoma carcinoma, and 59, 940 are going to be diagnosed with skin cancer, consistent with the American Cancer Society. luckily, skin cancers (basal cell and epithelial cell carcinoma, and malignant melanoma) ar rare in kids. Once melanomas occur, they sometimes arise from pigmented nevi (moles) that ar giant (diameter larger than half dozen mm), asymmetric, with irregular borders and coloration. Bleeding, haptic sensation and a mass beneath the skin are different signs of cancerous modification. If a child has had radiation treatment for cancer, nevi within the radiated space are at enhanced risk of turning cancerous. Carcinoma Detection System is the system to spot and acknowledge carcinoma symptoms and diagnose skin cancer in early stages. The user can take early prevention of their health. Carcinoma Detection System can facilitate save many doctor's time and will facilitate to diagnose additional accuracy. It can also simply assess the future development of skin via qualitative analysis today's age of the skin and hints the most effective characteristic carcinoma project to consumer [1].

2. Image Acquisition

Image acquisition Dermoscopic pictures are essentially digital photographs/images of enlarged skin lesion, taken with a standard camera equipped with special lens extension. The lens hooked up to the dermatoscopy acts sort of like a microscope scientific instrument with its own light source that illuminates the skin surface equally. There are numerous styles of dermoscopy equipment, however, all of them use the same principle and permit registering skin pictures with x10 magnification and higher. Because of the light supply integrated into the dermatoscopy lens, there happens to be a problem with skin reflections. To counteract this downside, a liquid is employed as a medium layer between the lens and the skin. In a modern dermoscopy, the liquid isn't necessary, thanks to the polarized light source that removes the reflection downside. Digital pictures acquired using photo dermatoscopy are sufficiently high resolution to allow for precise analysis in terms of differential structures look. A specialist will produce accurate documentation of gathered pictures, opening a path for computer analysis, wherever pictures are processed so as to extract info which will later be used to classify the pictures using machine learning algorithms.

3. Image Preprocessing

Pre-processing is a common name for operations with images at the lowest level of abstraction -- both input and output are intensity images. The aim of pre-processing is an improvement of the image data that suppresses unwanted distortions or enhances some image features important for further processing.

Four classes of image pre-processing strategies according to the dimensions of the pixel neighborhood that's used for the calculation of a new pixel brightness: pixel brightness transformations, geometric transformations, pre-processing strategies that use an area neighborhood of the processed pixel, and image restoration that needs data regarding the whole image. Other classifications of image pre-processing strategies exist.

Image pre-processing methods use the considerable redundancy in images. Neighboring pixels corresponding to one object in real images have essentially the same or similar brightness value. Thus, distorted pixel can often be restored as an average value of neighboring pixels. Do you remember the example of filtering impulse noise?

If pre-processing aims to correct some degradation in the image, the nature of a priori information is important: ▫ knowledge about the nature of the degradation; only very general properties of the degradation are assumed. ▫ knowledge about the properties of the image acquisition device, and conditions under which the image was obtained. The nature of noise (usually its spectral characteristics) is sometimes known.

▫ knowledge about objects that are searched for in the image, which may simplify the pre-processing very considerably.

4. Methodologies

Cancer image classification maps as no of world observation cancer increasing day by day and these cancer contains different tools capable of capturing imagery time to time and utilized for a wide range of application. Thus classification of cancer imagery has current area of researches and classification results can be used for different real-time application. This system proposed a novel approach for classification of six different classes' actinic keratosis, Basel cell carcinoma, cherry nevus, dermatofibroma, Melanocytic nevus and Melanoma by utilizing Cancer imagery. To achieve an effective Cancer image classification framework this system isolates its works in various stage; these phases are important to give the better classification accuracy and the next page described these phases in details.

- A Cancer image is chosen for classification.

- Noise Filtering is used to filter the unnecessary information and remove various types of noises from the images using image processing toolbox.

- Apply Fuzzy C Means

- Feature Extraction Using Gabor Filter

- Training and testing framework using SVM
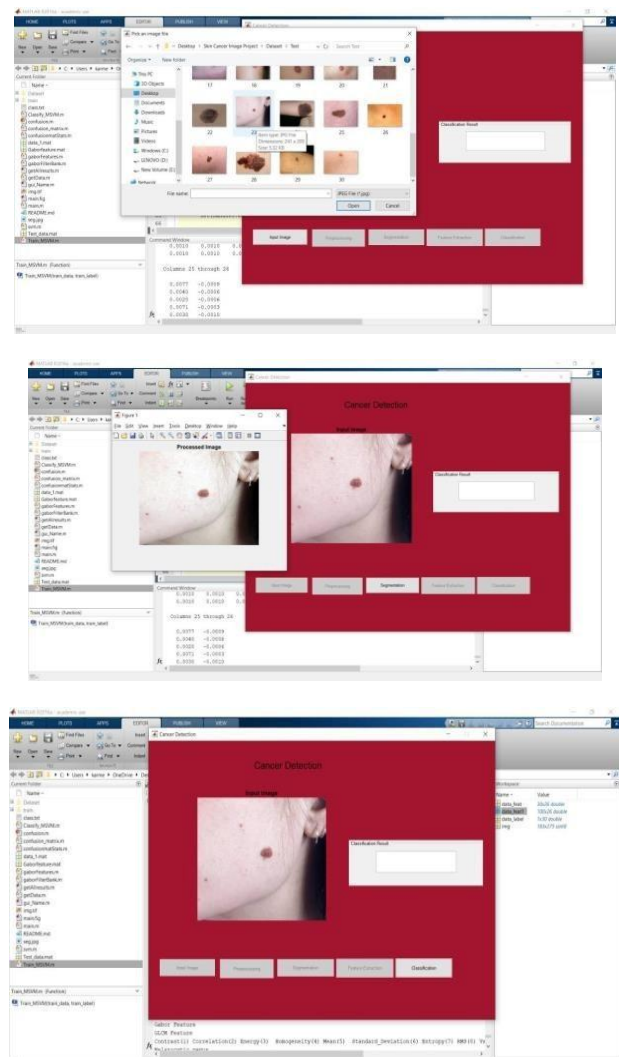
- Classified Image

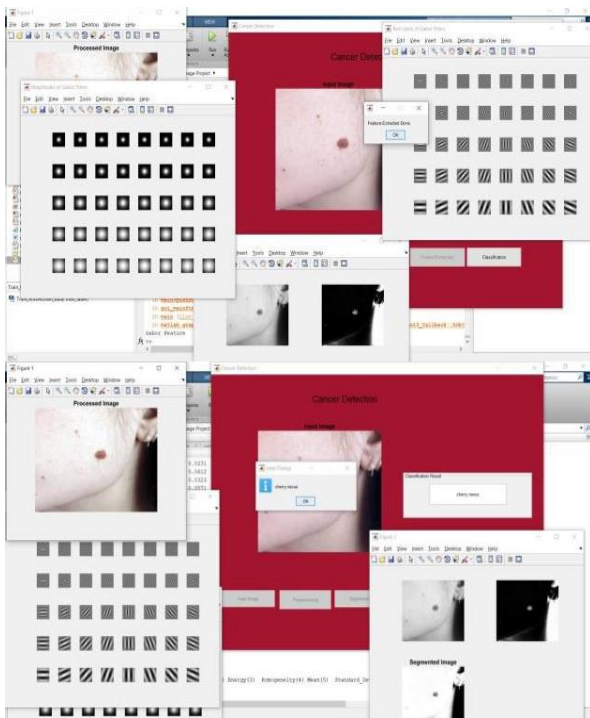## 5. Technologies

MATLAB

- GLCM

- SVM

- Image Processing

- Gabor Filtering

6. FLOW CHART
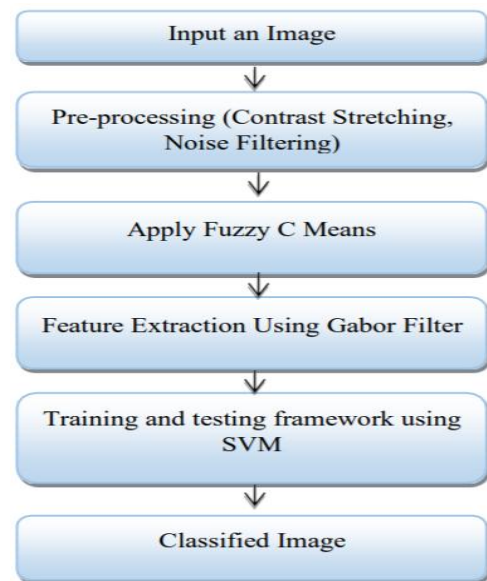
7. RESULTS

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8. CONCLUSIONS AND FUTURE WORKS

In this study, we have examined various non-invasive techniques for skin cancer classification and detection. The melanoma detection requires various stages like preprocessing, segmentation, feature extraction and classification. This survey focuses on different strategies like Genetic Algorithm, SVM, CNN, ABCD rule etc. As per the review, each algorithmis found to have its advantages and disadvantages. However, amongst the analysed algorithm, the SVM algorithm has the least amount of disadvantages and thus, out weighs other algorithms like K-mean clustering and Back propogation neural networks.

The final output given by the system will help the dermatologist to detect the lesion and its type, accordingly with his knowledge he will examine the patient to draw a final conclusion whether it can be operated or not or any other way to cure it for e.g. using medicines or ointments, etc. Skin cancer detection System will help Dermatologist to diagnose melanoma in early stages. The future scope of the skin cancer detection system is that it can be more accurate and efficient. The ABCD rule of skin cancer detection is the most adopted method of skin cancer in the world. The scope is that the system can be implemented in the stand alone application. The system can be more reliable and robust. The system may provide the Encryption of data and authentication for the users so that there is no unauthorized access of the data of the patient, because if there is unauthorized access is performed on the data then the data integrity may be lost. In future it is more interactive and use friendly for checking the lesion that if it is cancerous or not cancerous which will give us pure classification.

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